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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,664	01/17/2002	Paul David Cannon	ROCH-001DIV	4008

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EXAMINER	
BASI, NIRMAL SINGH	

ART UNIT	PAPER NUMBER
1646	

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/052,664	CANNON ET AL.	
	Examiner	Art Unit	
	Nirmal S. Basi	1646	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on 2/23/04

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) 1 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) 1 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Amendment filed 2/23/04 has been entered.

2. The drawings of Figure 2 were received on 2/23/04. These drawings are approved by Examiner.

3. The rejection of claim 1 is maintained under 35 USC § 101 and 35 USC § 112, 1st paragraph, for reasons of record, see Office Action dated 11/20/03. Applicant's arguments have been fully considered and not found persuasive. Applicant's arguments are addressed below:

Applicant argues, on page 4 or the Amendment, "The specification clearly states the function of the Npt2LB polypeptide of the subject of the invention, which is, a sodium phosphate co-transporter expressed in intestinal epithelial cells that is responsible for absorption and uptake of phosphate in the intestine page 4 line 9; page 2 line 14)". Applicants arguments pertaining to claimed invention being a sodium phosphate co-transporter expressed in intestinal epithelial cells that is responsible for absorption and uptake of phosphate in the intestine are not fully supported by the specification on page 4 line 9; page 2 line 14,as claimed. Page 4, lines 9-10, of the specification states, "A novel human sodium phosphate co-transporter expressed in intestinal cells, as well as polypeptide composition related thereto, are provided". Page 2, lines 12-14, of the specification state, "Because of the wide variety of disease conditions characterized by the presence of abnormal Pi metabolism, there is continued interest in the molecular components responsible for Pi metabolism". The stated pages do not disclose sodium

phosphate co-transporter is responsible for absorption and uptake of phosphate in the intestine.

Applicant argues the specification discloses specific diseases associated with the claimed polypeptide are diseases characterized by abnormally high phosphate absorption (various diseases are disclosed), as well as diseases characterized by abnormally low phosphate absorption (various diseases are disclosed). Further Applicants submit a Declaration by Dr. Sankuratri, with attached Exhibit 1. The declaration discloses procedures described, on page 29 of the specification, have been used to show claimed polypeptide transports phosphate ions is responsible for phosphate absorption in the intestine. Further the Declaration by Dr. Sankuratri and the Amendment argue that Npt2B may be used in screening assays to identify inhibitors of transporter function and in turn would be of significant importance in treating diseases characterized by abnormally high phosphate absorption. Also, Dr. Sankuratri compares the biochemical characteristics of Npt2 B with those of Npt2A.

Applicant's arguments, the Declaration of Dr. Sankuratri, and Exhibit 1 have been fully considered but not found persuasive. The inclusion in the family of sodium phosphate co-transporter does not constitute either a specific and substantial asserted utility or a well-established utility for claimed Npt2B polypeptide. This is analogous to all proteins/nucleic acid of sodium phosphate co-transporter proteins can be used as markers on a gel. Specification discloses claimed sodium phosphate co-transporter are useful in screening but the specification does not disclose what claimed sodium phosphate co-transporter specifically regulates and what specific disease, claimed

sodium phosphate co-transporter, is a target for. The specification provides a diverse list of disease states that may be involved in Pi dysfunction. A utility to orphan Npt2B cannot be assigned without knowledge of what disease is associated with claimed Npt2B dysfunction or what drugs/ligands affect a specific claimed Npt2B function. The superfamily of sodium phosphate co-transporters is highly divergent in their effects and compound specificity. The utility of claimed sodium phosphate co-transporter cannot be implicated solely from homology to known sodium phosphate co-transporter or their protein domains because the art does not provide teaching stating that all members of family of sodium phosphate co-transporter must have the same effects, the same ligands and be involved in the same disease states, the art discloses evidence to the contrary. The Declaration of Dr. Sankuratri highlights this point. Dr. Sankuratri disclose two transporter proteins, Npt2b and Npt2A, both require sodium to transport phosphate but the uptake kinetics of the two transporters is quite different, Npt2A demonstrated higher affinities for both sodium and phosphate ions than Npt2A. The two transporters also had opposite responses to pH changes. It is noted, at the time of filing of instant Patent Application, the claimed polypeptide was not expressed in a cell to determine its transport properties, or even to specifically show it transports sodium or phosphate. The sodium dependence of claimed polypeptide was unknown. In instant case post filing art cannot be used to establish utility because the results of said art were not known at the time of filing of instant application, and the information obtained was due to further experimentaion. The unpredictability of assigning a function to claimed polypeptide based on its relationship to other members of the family is discussed in the

prior rejection of record. Even if claimed polypeptide transports phosphate Applicants arguments pertaining to its involvement in disease states characterized by both abnormally high phosphate absorption (various diseases are disclosed), as well as diseases characterized by abnormally low phosphate absorption is not found persuasive. The specific disease associated with claimed invention has not been disclosed. The particular involvement in a disease state has not been disclosed. The proposed methods disclosed on page 29 of the specifcation identified no inhibitors of claimed invention at time of filing. The claimed polypeptide had s not even been expressed in a cell to determine its transport properties, or even to specifically disclose it transports sodium and phosphate. It is also not clear how the claimed polypeptide can be specific for both disease states that are characterized by both abnormally high phosphate absorption as well as abnormally low phosphate absorption. Neither the specification or prior art disclose of an example where interfering with transport of a specific compound, by claimed polypeptide, has been associated with the treatment of a specific disease state. Even if the claimed polypeptide transports phosphate the specification does not disclose any specific and substantial interpretation for which disease states are specifically affected by said transport. Would an antagonist be used to treat a disease? Would an agonist be used to treat a disease? What disease would be treated? Further, the person of ordinary skill in the art would not find substantial the assertion that just because a polypeptide transports phosphate automatically means it has to be involved in any of the diseases claimed by Applicant based on the disclosure. Given this consideration, the individually claimed sodium phosphate co-transporter

protein has no specific, substantial and credible or well-established use. The artisan is required to perform further experimentation on the claimed sodium phosphate co-transporter protein itself in order to determine to what "use" any information regarding this proteins functionality could be put. The presence of claimed sodium phosphate co-transporter protein in tissue is not sufficient for establishing a utility in diagnosis of disease in the absence of some information regarding a correlative or causal relationship between the expression of the claimed sodium phosphate co-transporter protein and the disease. If a molecule is to be used as a surrogate for a disease state, some disease state must be identified in some way with the molecule. However, in the absence of any disclosed relationship between the claimed sodium phosphate co-transporter protein and any disease or disorder and the lack of any correlation between the claimed sodium phosphate co-transporter protein with any known disease or disorder, the limited information disclosed for claimed invention would only serve as the basis for further research on the observation itself. "Congress intended that no patent be granted on a chemical compound whose sole 'utility' consists of its potential role as an object of use-testing." *Brenner*, 148 USPQ at 696. The disclosure does not present a substantial utility that would support the requirement of 35 U.S.C. §101.

It has been argued the claimed sodium phosphate co-transporter protein is useful as a screening tool. All members of the sodium phosphate co-transporter protein family have a utility in selectively screening of candidate drugs that target sodium phosphate co-transporter. However, for a utility to be "well-established" it must be specific, substantial and credible. In this case, as all sodium phosphate co-transporters are in

some combination useful in selectively screening of candidate drugs that target sodium phosphate co-transporter. However, the particulars of screening of candidate drugs that target claimed sodium phosphate co-transporter are not disclosed in the instant specification. Neither the candidate drugs or toxic substances nor the susceptible organ systems are identified. Therefore, this is a utility, which would apply to virtually every member of a general class of materials, such as any collection of proteins or DNA, but is only potential with respect to SEQ ID NO:1. Because of this, such a utility is not specific and does not constitute a "well-established" utility. Further, because any potential diagnostic utility is not yet known and has not yet been disclosed, the utility is not substantial because it is not currently available in practical form. Moreover, use of the claimed protein for screening compounds that are a target for claimed sodium phosphate co-transporter protein is only useful in the sense that the information that is gained from the assay and is dependent on the effect it has on the protein, and says nothing with regard to each individual sodium phosphate co-transporter family. Again, this is a utility, which would apply to virtually ever member of a general class of materials, such as any collection of proteins or DNA. Even if the expression of Applicants' individual sodium phosphate co-transporter protein is affected by a test compound in an assay for drug screening, the specification does not disclose any specific and substantial interpretation for the result, and none is known in the art. Given this consideration, the individually claimed method of using sodium phosphate co-transporter protein has no "well-established" use. The artisan is required to perform

further experimentation on the claimed sodium phosphate co-transporter protein itself in order to determine to what "use" any information regarding this protein could be put.

Without knowing a biological significance of the claimed sodium phosphate co-transporter protein, one of ordinary skill in the art would not know how to use the claimed invention. The specifcation does not disclose a specific and substantial asserted utility or a well-established utility for claimed Npt2B polypeptide in its currently available form, in a credible "real world" manner, based on the diversity of biological activities possessed by the sodium phosphate co-transporter family. Contrast *Brenner*, 148 USPQ at 694 (despite similarity with adjacent homologue, there was insufficient likelihood that the steroid would have similar tumor-inhibiting characteristics), with *In re Folkers*, 145 USPQ 390, 393 (CCPA 1965) (some uses can be immediately inferred from a recital of certain properties) or *In re Brana*, 34 USPQ 1436, 1441 (Fed. Cir. 1995) (evidence of success in structurally similar compounds is relevant in determining whether one skilled in the art would believe an asserted utility; here, an implicit assertion of a tumor target was sufficiently specific to satisfy the threshold utility requirement).

For all the above reasons and those presented in the prior Office Action, the disclosure is insufficient to teach one of skill in the art how to use the invention.

A rejection under § 112, first paragraph, may be affirmed on the same basis as a lack of utility rejection under § 101. *See, e.g., In re Swartz*, 56 USPQ2d 1703 (Fed. Cir. 2000); *In re Kirk*, 153 USPQ 48 (CCPA 1967

4. No claim is allowed

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nirmal S. Basi whose telephone number is 571-272-0868. The examiner can normally be reached on 9:00 AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Kunz can be reached on 571-272-0887. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nirmal S. Basi
Art Unit 1646
May 14, 2004

Lorraine Spector

LORRAINE SPECTOR
PRIMARY EXAMINER